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57605 7590 12/07/2010 APPLIED MATERIALS, INC. c/o SNR DENTON US LLP P.O. BOX 061080 CHICAGO, IL 60606-1080			USA/PDC/PDC/EZILBER	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/796,938  
Filing Date: March 09, 2004  
Appellant(s): NAFTALI, RON

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Timothy M. Nitsch  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 15 November 2010 appealing from the Office action mailed 07 July 2010.

**(1) Real Party in Interest**

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The following is a list of claims that are rejected and pending in the application:

Claims 1, 3, and 4 are pending and rejected.

**(4) Status of Amendments After Final**

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

**(5) Summary of Claimed Subject Matter**

The examiner has no comment on the summary of claimed subject matter contained in the brief.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

**(7) Claims Appendix**

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

**(8) Evidence Relied Upon**

7,022,452

Lu

04-2006

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu (7,022,452).

**Claim 1:** Lu discloses a method (15) (Fig 4) for recording a pattern (21), comprising:

determining an illumination scheme in response to the pattern (C3L38-39: inherent in photolithographic method);

directing, in response to the determination, at least one focused beam of radiation (C4L31) having a first cross-section (at surface of 16) through an objective lens (C1L20) onto an intermediate layer (16), said intermediate layer comprising a

contrast enhancing layer (16), said contrast enhancing layer configured to allow only a portion of said beam, said portion having a second cross-section (at surface of 10), to propagate towards a radiation sensitive layer (10), said second cross-section being smaller than the first cross-section, and

removing said intermediate layer after the pattern has been printed (C4L56-59).

Lu does not disclose expressly the contrast enhancing layer being a saturable absorber.

However, [003] of the instant application states, "A material can be regarded as a saturable absorber if its light absorption decreases with increasing light intensity."

Similarly, Lu teaches, in C4L44-48, "Therefore, contrast enhancing layer 16 allows the high intensity portions of the aerial image ... to be preferentially transmitted to photoresist layer 10." Based on these descriptions, a contrast enhancing layer acts as a saturable absorber, only allowing light transmittance under high intensity portions of the radiation beam.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to recognize that the contrast enhancing layer of Lu has the same properties as a saturable absorber and could be used as such, for the purpose of forming sharp patterns to achieve devices with better performance.

**Claim 3:** wherein the second cross-section is about half of the first cross-section (Fig 4).

**Claim 4:** further comprising altering an intensity of the beam of radiation to achieve a certain second cross-section (Fig 5).

**(10) Response to Argument**

**1. *The claims are allowable in view of 35 USC 112, second paragraph.***

Appellant argues on page 4, line 3 to page 5, line 2 that the claim 1 limitation “at least one focused beam of radiation having a first cross-section through an objective lens onto an intermediate layer” is supported by the specification and the figures.

The examiner respectfully disagrees. The recitation “a first cross-section through an objective lens” means that the first cross-section is located at the objective lens. According to the language of claim 1, the first cross-section is at the plane of the objective lens 20. However, this is contradictory to the specification and the drawings. The specification at [0020] discloses “at least one beam 30 having a first cross-section 32 towards a saturable absorber ... .” Additionally, amended Fig 1 filed on 07 September 2010 shows the first beam cross section 32 at the surface of the intermediate layer 16. As a result, the specification and the figures teach the first cross-section to be located at the surface of the intermediate layer, while claim 1 recites the first cross-section at the objective lens. Consequently, the claimed recitation is contradictory to the specification and the drawings regarding the location of the first cross-section. Therefore, claim 1 is rejected as being unclear and indefinite.

Claim 3 is similarly rejected. Claim 3 recites “wherein the second cross-section is about half of the first cross-section.” However, claim 1 requires that the first cross-section to be at the objective lens. As a result, the second cross-section 34 shown in Fig 1 is not about half of the first cross-section; rather, it is significantly less than half of the first cross-section. Consequently, the claim limitation is contradictory to Fig 1

regarding the relationship of the sizes of the first cross-section and the second cross-section. Therefore, claim 3 is rejected as being unclear and indefinite.

**2. *Claim 1 is not unpatentable in view of Lu.***

Appellant contends on page 5, lines 25-26, "Lu fails to disclose using an objective lens to focus radiation into a beam as required by the claims."

The examiner respectfully disagrees. A conventional photolithography apparatus includes a light source to emit a beam of light, an illumination system for directing the light, a mask or reticle to pattern the light, a projection system to focus the light, and a stage to hold the substrate that is exposed to the patterned light to create a pattern on the substrate. The projection system is composed of a plurality of lenses that demagnify and focus the light, such that the focal plane of the light coincides with the surface of the substrate. As a result, the lenses of the projection system enable a focused beam of light to strike the substrate, which allows the pattern that is written on the substrate to be focused.

Turning now to Lu, the invention is directed to a photolithographic method (column 3, lines 38-39). The photolithographic method of Lu comprises the features of a conventional photolithography apparatus. Moreover, Lu at column 1, lines 17-21 describes that projection lenses are used in the photolithographic method. Consequently, projection lenses are present in Fig 4 of Lu, though not shown. As in the conventional photolithography apparatus, the projection lenses of Lu are used to focus the light (arrows in Fig 4) onto the substrate 12. Therefore, the projection lenses of Lu teaches the claimed objective lens to focus radiation into a beam.

Furthermore, Lu shows in Fig 4 radiation, which is shown by arrows, forming different sized cross-sections entering and exiting the contrast enhancing layer 16. The cross-section entering the layer is larger than that exiting the layer. As a result, Lu discloses in Fig 4 a cross section of a beam (arrows) exiting a layer (16) being smaller than a cross-section of the beam entering the layer. Additionally, the contrast enhancing layer of Lu acts like a saturable absorber by only allowing light transmittance under high intensity portions of the radiation beam. Lu teaches in column 4, lines 44-48, "Therefore, contrast enhancing layer 16 allows the high intensity portions of the aerial image ... to be preferentially transmitted to photoresist layer 10." Moreover, Fig 5 shows that transmission increases with increasing dose. Consequently, Lu discloses in Fig 4 a focused beam (arrows) with a cross section that is reduced by a saturable absorber (16). Thus, Appellant's arguments on these points are not persuasive, and claim 1 is unpatentable in view of Lu.



**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Michael Liu

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